CLAIMS

1. A medium for optical recording, from which recorded information is reproduced by a laser beam, comprising:

a disk board having a recording surface; and

a plurality of pits in the recording surface, wherein each of said pits is comprised in a corresponding one of a plurality of cells each cell having equal size and varying pit-occupancy rates dependent on the recorded information, said pit-occupancy rate being the ratio of area of said pit to area of said cell corresponding to said pit,

wherein depths H of said pits, a wavelength λ of the laser beam, and a refractive index n of said board are related as:

$$\lambda/6n < H < \lambda/4n.$$

2. The medium for optical recording as claimed in claim 1, wherein said pits are comprised in central positions of said corresponding cells in substantially circular patterns having different radii.

3. The medium for optical recording as claimed in claim 1 wherein:

signals having a plurality of levels of N, N being dependent on the pit-occupancy rate, are generated; and

said pits comprising (N-1) different pit diameters, the (N-1) pit diameters being set so as to almost equally divide into N parts the difference between amount of light reflected from the cells in a case of pits with pit diameters having maximum values and amount of light reflected from the cells in a case of no pits existing.

4. The medium for optical recording as claimed in claim 3,

wherein modulation is 60% or above, said modulation being a ratio of a signal level corresponding to the maximum of said different (N-1) pit diameters to a signal level corresponding to the minimum of said different (N-1) pit diameters.

5. An apparatus for optical information processing, comprising:

an illumination optical system;

a receiving optical system which optically receives light reflected from a medium for optical recording comprising a plurality of pits; and

a signal-processing section which performs, based on signals detected which are optically received at the receiving optical system, processing of the signals,

wherein said receiving optical system comprises at least a pair of first receiving optical sections arranged symmetrically in a radial direction of said medium for optical recording within an area in a far-field in which a zeroth-order light reflected and ±first-order diffracted lights reflected from said pits overlap; and

said signal-processing section detects a tracking-error signal, based on differences among said at least the pair of first receiving sections of the signals detected at said first receiving optical sections, using a push-pull method.

6. The apparatus for optical information processing as claimed in claim 5,

wherein said receiving optical system further comprises, in addition to said first receiving optical sections, at least a pair of second receiving optical sections arranged symmetrically in the radial direction of said medium for optical recording within an area in the far-field in which only the zeroth-order light reflected from said pits exists; and

said signal-processing section comprises a correcting unit for correcting as the tracking-error signal said differences of the signals detected at said first receiving optical sections based on differences among said at least the pair of second receiving sections of the signals detected at said second receiving optical sections.

7. The apparatus for optical information processing as claimed in claim 6, wherein said correcting unit adjusts a predetermined gain K so as to compute, assuming the signals detected at said first receiving optical sections as a and b, and the signals detected at said second receiving optical sections as c and d, the tracking-error signal TE as:

$$TE=[\ (a-b)+K(c-d)\ ]/[\ (a+b)+K(c+d)\ ].$$

8. The apparatus for optical information processing as claimed in claim 7, wherein said correcting unit adjusts the predetermined gain K so as to minimize an offset component included in the tracking-error signal TE.

9. The apparatus for optical information processing as claimed in claim 7, wherein:

the medium for optical recording is one of a medium for optical recording of a reproduction type, and a medium for optical recording of a recording type, with continuously-running guiding channels; and

said correcting unit adjusts the predetermined gain K, depending upon whether the medium for optical recording is the medium for optical recording of the reproduction type or the medium for optical recording of the recording type.

10. The apparatus for optical information processing as claimed in claim 7, wherein said correcting unit, in a case where said medium for optical recording is a hybrid-type optical recording medium, comprising either a ROM area comprising the pits, or a RAM area comprising continuously-running guiding channels, adjusts the predetermined gain K, depending on whether the hybrid-type optical recording medium comprises the ROM area or the RAM area.

11. The apparatus for optical information processing as claimed in claim 6, wherein said first and second receiving optical sections comprise receiving optics having a partitioned structure quad-partitioned in the radial direction.

12. The apparatus for optical information processing as claimed in claim 6, wherein said first and second receiving optical sections comprise a combination of a diffracting device and a plurality of receiving optics,

said diffracting device having a partitioned structure arranged symmetrically in the radial direction of said medium for optical recording so as to diffract and to deflect in a predetermined direction the light reflected in the far field; and

said plurality of receiving optics optically receiving deflected light diffracted by the diffracting device.